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| IALA Model Course |

V-103/1

Vessel Traffic Services Operator Training

Edition 2.0

December 2009

Revisions to this IALA Document are to be noted in the table prior to the issue of a revised document.

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| Date | Page / Section Revised | Requirement for Revision |
| December 2009 | Entire document | Reflecting 10 years’ experience and the evolution of technology |
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FOREWORD

The International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) recognises that training in all aspects of the management of Aids to Navigation (AtoN) service delivery is critical to the consistent provision of that AtoN service.

Taking into account that under the SOLAS Convention, Chapter V, Regulation 13, paragraph 2, Contracting Governments, mindful of their obligations published by the International Maritime Organisation, undertake to consider the international recommendations and guidelines when establishing aids to navigation, including recommendations on training and qualification of AtoN managers, IALA has adopted Recommendation E-141 on Standards for Training and Certification of AtoN personnel.

IALA Committees working closely with the IALA World Wide Academy (The Academy) have developed a series of model courses for AtoN personnel having E-141 Level 1 management functions. This model course on Level 1 Aids to Navigation Manager Training should be read in conjunction with IALA Recommendation E- 141 on Standards for Training and Certification of AtoN Personnel[[1]](#footnote-1). Mindful of the desire to harmonise the delivery of its published model courses, IALA has developed Guidelines for the accreditation and approval process for both AtoN personnel training (Guideline 1100) and Vessel Traffic Service training (Guideline 1014).

This model course is intended to provide national members and other appropriate authorities charged with the provision of AtoN services with specific guidance on the training of AtoN managers. It is intended to be delivered by The Academy or a Training Organisation accredited by a national Competent Authority. Assistance in implementing this and other model courses may be obtained from the IALA World Wide Academy at the following address:

The Dean

IALA World Wide Academy Tel: (+) 33 1 34 51 70 01

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1. - COURSE OVERVIEW

# OVERVIEW

IALA recommends that Training Organisations and other training providers utilise model courses concerned with the provision of AtoN services, including VTS, in accordance with IALA Recommendation E-141.

# PURPOSE OF THE MODEL COURSE

The purpose of the model course is to assist maritime training organisations and their teaching staff in the preparation and introduction of new training courses for VTS Operators, or in enhancing, updating or supplementing existing training material where the quality and effectiveness of the training courses may thereby be improved.

This course provides details of the subject areas for knowledge and practical competence required for a VTS trainee to gain a course certificate as part of the qualification for becoming a VTS Operator.

# USE OF THE MODEL COURSE

The complete course comprises eight modules, each of which deals with a specific subject representing a requirement or function of a VTS Operator. Each module contains a subject framework stating its scope and aims, a subject outline and a detailed teaching syllabus.

The course also provides participants with the opportunity to exercise the role of a VTS Operator. These exercises should, wherever practicable, use simulation. Where simulation is not practicable, the exercises should be designed to be fully representative of appropriate situations that occur in a VTS.

# AIMS AND OBJECTIVES

Body text

# INTRODUCTION

Body text

# TEACHING AIDS

Teaching aids that participants ideally should have access to:

A1 Simulated VTS environment capable of meeting the training objectives

A2 Briefing/debriefing area for simulations, including facilities for modelling performance and reviewing recorded exercises

A3 Charts and associated publications

A4 Examples of Notices to Mariners applicable to a VTS area

A5 Ship models

A6 Video recording and playing facilities

A7 Audio recording and playing facilities

A8 Interactive language laboratory

A9 Personal computer

A10 Simulator exercises to practice operational maritime English

A11 Examples of equipment and systems capable of being manipulated in a manner like the equipment and systems used in VTS centres

A12 Interactive VTS simulator, including VHF facilities

A13 Simulated VHF DF system including digital selective calling facilities

A14 Appropriate video films

A15 Manuals, strip cards and other facilities for use with the monitoring systems being taught

A16 Appropriate interactive video

A17 Guest speakers

A18 Case studies

# Equipment

Equipment that participants should have access to:

E1 Headset/microphone with press to talk (PTT) facilities

E2 Logging system

E3 Desks approximately 1 metre long by 0.7 metres width, with drawers for chart stowage (Chart work exercises)

E4 Protractor, parallel ruler, dividers, nautical almanac, charts of a VTS area, calculator, chart correcting facilities

E5 Audio tapes of recorded VTS communications

# ACRONYMS

AIS Automatic Identification System(s)

APL Accredited Prior Learning

ARPA Automatic Radar Plotting Aid

CCTV Close circuit television

CD-ROM Compact Disc – Read only memory

COLREGS International Regulations for Preventing Collisions at Sea

DF Direction Finding

DGNSS Differential Global Navigation Satellite System(s)

DR Dead reckoning

DSC Digital Selective Calling

ECDIS Electronic Chart Display and Information System(s)

ECS Electronic Chart System(s)

EP Estimated position

ETA Estimated Time of Arrival

GMDSS Global Maritime Distress and Safety System

GNSS Global Navigation Satellite System(s)

IALA International Association of Marine Aids to Navigation and Lighthouse Authorities - AISM

ICAO International Civil Aviation Organization

IELTS International English Language Test System

IMO International Maritime Organization

ISBN International Standard Book Number

ISPS International Ship and Port Facility Security (Code)

Lat Latitude

LBP Length between perpendiculars

LLTV Low light television

LOA Length overall

LOCODE United Nations Code for Trade and Transport Locations

Long Longitude

LNG Liquified Nitrogen Gas

LOP Line(s) of position

LPG Liquified Petroleum Gas

MAS Maritime Assistance Service

OJT On-the-Job Training

PTT Press To Talk

Racon Radar beacon(s)

Ramark Radar mark(s)

ROC Restricted Operator’s Certificate (GMDSS)

Ro-ro Roll on – roll off

RR Radio Regulations

SAR Search and Rescue

SMCP Standard Marine Communication Phrases (IMO)

STCW Standards of Training, Certification and Watchkeeping of Seafarers, 1978, as amended

VHF Very High Frequency (30 MHz to 300 MHz)

VTMIS Vessel Traffic Management Information System(s)

VTS Vessel Traffic Services

WIG Wing in ground

# REFERENCES relevant to the planning of VTS training

1. SOLAS’ 74 Regulation V/10 – Ships’ routeing\*
2. SOLAS ’74 Regulation V/11 - Ship reporting systems\*
3. SOLAS ’74 Regulation V/12 - Vessel traffic services\*
4. SOLAS ’74 Regulation V/27 - Nautical charts and nautical publications\*
5. SOLAS ’74 Regulation V/7 – Search and rescue services\*
6. United Nations Convention on the Law of the Sea (UNCLOS)\*
7. International Regulations for Preventing Collisions at Sea, 1972 (COLREGS)\*
8. International Maritime Dangerous Goods Code (IMDG Code)\*
9. International Convention on Standards of Training, Certification and Watchkeeping of Seafarers, 1978, as amended in 1995 (STCW Convention)\*
10. Seafarer’s Training, Certification and Watchkeeping Code (STCW 95 Code)\*
11. IMO GMDSS Manual\*
12. IMO publication on Ships’ Routeing\*
13. IMO/ICAO Publication “International Aeronautical and Maritime Search and Rescue (IAMSAR) manual” \*- in three volumes:

Vol 1 – Organization and management (IMO 960)

Vol 2 – Mission co-ordination (IMO 961)

Vol 3 – Mobile facilities (IMO 962)

1. IMO Assembly resolution A.705(17), Promulgation of Maritime Safety Information (MSI)\*
2. IMO Assembly resolution A.772(18), Fatigue factors in manning and safety\*
3. IMO Assembly resolution A.851(20), General principles for ship reporting systems and ship reporting requirements, including guidelines for reporting incidents involving dangerous goods, harmful substances and/or marine pollutants\*
4. RIMO Assembly resolution A.857(20), Guidelines for Vessel Traffic Services\*
5. IMO Assembly resolution A.917(22), as amended by resolution A.956(23) on Guidelines for the onboard operational use of shipborne automatic identification systems (AIS)\*
6. IMO Assembly resolution A.918(22), Standard Marine Communication Phrases\*
7. IMO Assembly resolution A.950(23), Maritime Assistance Service (MAS)\*
8. IMO Assembly resolution A.954(23), Proper use of VHF channels at sea\*
9. IMO Maritime Safety Committee resolution MSC.232(82), Revised performance standards for Electronic Chart Display and Information Systems (ECDIS)\*
10. IMO COMSAR/Circ.15 - Joint IMO/IHO/WMO Manual on Maritime Safety Information (MSI)\*
11. IMO MSC/Circ.1014, Guidelines on fatigue mitigation and management\*
12. IMO SN/Circ.244, Guidance on the use of the UN/LOCODE in the destination field in AIS messages\*
13. International Code of Signals\*
14. IHO approved documents of charts and publications
15. TU Radio Regulations, including Appendices
16. ITU-R Recommendation M.493, DSC for use in the maritime mobile services
17. ITU-R Recommendation M.541, Operational procedures for the use of DSC equipment in the maritime mobile services
18. ITU-R Recommendation M.1371, Technical characteristics for an automatic identification system using time division multiple access in the VHF maritime mobile band
19. IELTS Handbook - British Council, or equivalent
20. Marine Communications Handbook - Lloyds of London
21. Equipment and system operating manuals
22. National, regional and local legislation and regulations on VTS, ports, harbours, pilotage and allied services
23. National Notices to Mariners pertaining to VTS
24. National procedures and standards for operation of VTS
25. National procedures and standards for operation of International Convention for the Prevention of Pollution from Ships (MARPOL)
26. National arrangements for intervention, pollution and salvage
27. Local/regional contingency and emergency requirements
28. IALA Vessel Traffic Services Manual
29. IALA Aids to Navigation Guide (NAVGUIDE)
30. International Maritime Buoyage System (MBS), published by IALA
31. IALA Recommendation V-103, Standards of training and certification of VTS Personnel
32. IALA Recommendation V-119, Implementation of Vessel Traffic Services
33. IALA Recommendation V-120, Vessel Traffic Services in Inland Waters
34. IALA Recommendation V-125, The Use and Presentation of Symbology at a VTS Centre (including AIS)
35. IALA Recommendation V-127, Operational procedures for Vessel Traffic Services
36. IALA Recommendation V-128, Operational and technical performance requirements for VTS equipment
37. IALA Guideline 1017, Assessment of Training Requirements for Existing VTS Personnel, Candidate VTS Operators and Revalidation of VTS Operator Certificates
38. IALA Guideline 1026, AIS as a VTS tool
39. IALA Guideline 1027, Designing and implementing simulation in VTS Training at Training Institutes/VTS Centres
40. IALA Guidelines 1028, The Automatic Identification System (AIS) Volume 1, Part I Operational Issues
41. IALA Guideline 1032, Aspects of Training of VTS Personnel relevant to the introduction of the Automatic Identification System
42. IALA Guideline 1045, Staffing levels at VTS centres
43. IALA Guideline 1050, Management and Monitoring of AIS Information
44. IALA Guideline 1056, Establishment of VTS Radar Services (Ed 1)
45. IALA Guideline 1068, Provision of a Navigational Assistance Service by Vessel Traffic Services
46. IALA Guideline 1070, VTS role in managing Restricted or Limited Access Areas
47. IALA Guideline 1071, Establishment of a Vessel Traffic Service beyond territorial seas

\* There is an annual catalogue of IMO Publications, many of which are printed in languages other than English. The catalogue provides ISBN and IMO references to these publications and the price, together with order forms which may be faxed. Additionally, training organisations and course co-ordinators should note that groups of publications are also made available on CD-ROM, and may be a more convenient method of obtaining some of the data that they require.

The catalogue contains a list of national distributors who maintain stocks of IMO Publications.

The IMO Publications catalogue is available free of charge from:

IMO Publishing Service

4 Albert Embankment

LONDON SE1 7SR Tel: +44 (0) 20 7735 7611

United Kingdom Fax: +44 (0) 20 7587 3241

e-mail: [sales@imo.org](mailto:sales@imo.org) <http://www.imo.org>

1. - DELIVERY OF THE MODEL COURSE

# INTRODUCTION

All training and assessment of personnel for gaining the course certificate as part of the qualification towards becoming a VTS Operator should be:

1. Structured in accordance with written programmes, including such methods and means of delivery, procedures and course material as are necessary to achieve the prescribed standard of competence; and,
2. Conducted, monitored, assessed and supported by persons qualified in accordance with Part C, section 4 Training Staff Requirements.

Training staff should review the course outline and detailed syllabus in each subject. The actual level of knowledge, skills and prior technical education of the participants in the subject concerned should be kept in mind during this review. Any differences between the level of skills and competencies of the participant and those identified within the detailed training syllabus should be identified. To compensate for such differences, the instructor is expected to delete from the course, or reduce the emphasis on, items dealing with knowledge or skills already attained by the participants. The instructor should also identify any academic knowledge, skills or technical training that the participants may not have acquired.

By analysing the detailed syllabus and the academic knowledge required to allow training in the technical area to proceed, the instructor can design an appropriate pre-entry course in the subjects in which weakness is evident. Alternatively, the elements of academic knowledge required to support the technical training elements concerned may be inserted at appropriate points within the syllabus.

Adjustment of the module objectives, scope and content for each subject may also be necessary if the participants completing the course are to undertake duties which differ from the objectives specified.

# COURSE MODULES

The modular presentation enables the instructor to adjust the course content to suit the participant intake and provide any revisions of the subject objectives as required. The instructor should draw up lesson plans based on each detailed syllabus and the references in them to the textbooks and teaching material suggested for the course. Where no adjustment has been found necessary in the subjects of a detailed syllabus, the lesson plans may simply consist of the detailed syllabus with keywords or other reminders added to assist the instructor in making his presentation of the material.

To assist in the development of lesson plans, five levels of competence are used in the model courses for VTS personnel. Levels 1 to 4 are used in the model course for the training of VTS Operators and levels 3 to 5 are used in the model course for VTS Supervisor. See Table 1 in Part D, section 3 – Lesson Plans.

Each level of competence is defined in terms of the learning outcome, the instructional objectives and the required skills. The recommended level of competence for each subject is indicated in the Subject Outline of each module.

# SUBJECT OUTLINE

The subject outline of each module also includes a total recommended number of hours that should be allotted to each module. However, it should be appreciated that these allocations are arbitrary and assume that the participants have met fully all the entry requirements specified for each subject. The instructor should therefore review carefully lesson plan design and consider the need to reallocate the time required to achieve each specific learning objective. In addition, the opportunity to reduce formal training time through recognition of Accredited Prior Learning (APL) should be taken advantage of whenever documented evidence of prior learning or professional certification can be produced by the course participants.

# DETAILED TEACHING SYLLABUS

The detailed teaching syllabus, of each module has been written in learning-objective format in which the objective describes what the participant must do to demonstrate that knowledge has been transferred. All objectives are understood to be prefixed by the words:

*the expected learning outcome is that the participant has acquired the recommended levels of competence in …….*

In preparing a teaching scheme and lesson plans, the instructor is free to use any teaching method or combination of methods that will ensure participants can meet the stated objectives. However, it is essential that participants complete the subject matter set-out in each module.

# PRESENTATION

The presentation of concepts and methodologies may be repeated as necessary in various ways until the instructor is satisfied that the participant has attained a good working knowledge in each subject.

# EVALUATION OR ASSESSMENT OF THE COURSE PARTICIPANTS

The evaluation criteria are contained in column 4 of the VTS Operator competence chart (see Annex 1), and provide the means for an assessor to judge whether a participant is competent to perform the related tasks, duties and responsibilities.

# IMPLEMENTATION

For the course to run smoothly and effectively, considerable attention must be paid to the availability and use of:

* qualified instructors;
* support staff;
* rooms and other spaces;
* equipment;
* textbooks, technical papers;
* other reference material.

**Thorough preparation is key to successful implementation of the course.**

# VALIDATION

The information contained in this document has been validated by a group of technical advisers, consultants and experts on training of VTS personnel. These were drawn from the IALA VTS Committee, training organisations of IALA national members and experienced VTS personnel so that the standards implemented may be as uniform as possible. Validation in the context of this document means that the group has found no grounds to object to its contents.

1. - COURSE FRAMEWORK

# INTRODUCTION

The model course covers the requirements of the IALA Recommendation V-103. On successful completion of the course and assessments, the participants should have been provided with sufficient training and to proceed to the next stage of On-the-Job Training (OJT) at a VTS centre.

# REQUIREMENTS FOR ATTAINING THE COURSE CERTIFICATE

Every candidate for a VTS Operator course certificate should:

* have achieved the International English Language Testing System (IELTS) level 5, or its equivalent;
* satisfy the competent/VTS authority by passing the appropriate assessments for the accredited course of operator training and that they possess the theoretical and practical knowledge appropriate to the requirements of a VTS Operator.

# COURSE INTAKE – LIMITATIONS

Class sizes may be limited at the discretion of the Competent Authority to allow the instructor to give adequate attention to individual participants. In general, it is recommended that a maximum of 12-14 participants be the upper limit that a single instructor can be expected to train satisfactorily to the level of competence involved. Larger numbers may be admitted if extra staff and tutorial periods are provided to deal with participants on an individual basis.

During practical sessions and group activities there may be additional restraints on class size. Where the use of a simulator or similar teaching aid is involved, it is recommended that no more than two participants be trained simultaneously on any individual piece of equipment.

# TRAINING STAFF REQUIREMENTS

All instructors and assessors should be appropriately qualified for the types and levels of training or assessment required for the model course.

The accredited training programme for VTS Operators should ensure that the qualifications and experiences of instructors and assessors are covered in the application of appropriate quality training standards. Such qualifications, experience and application of quality standards should incorporate appropriate training in instructional techniques, and training and assessment methods and practices, and comply with all applicable recommendations set out in the following paragraphs.

As well as instructors and assessors, additional staff may be required for the maintenance of equipment and for the preparations of materials, work areas and supplies for the practical work.

## Course Instructors

Any person conducting training of personnel qualifying for certification as VTS Operators should:

* have an appreciation of the training programme and an understanding of the specific training objectives for the type of training being conducted;
* be professionally and academically qualified in the task for which training is being conducted;
* have an appropriate balance of professional and teaching qualifications;
* if conducting training with the use of a simulator:
* have received appropriate guidance in instructional techniques involving the use of simulators;
* have gained practical operational experience on the simulator being used.

## Course Assessors

Any person conducting assessment of competence of personnel should:

* have an appropriate level of knowledge and understanding of the competence to be assessed;
* be qualified in the task for which the assessment is being made;
* have received appropriate guidance in assessment methods and practices;
* have gained practical assessment experience;
* if conducting assessment involving the use of simulators, have gained practical assessment experience on the type of simulator under the supervision, and to the satisfaction, of an experienced assessor.

# TEACHING FACILITIES AND EQUIPMENT

Facilities other than an ordinary classroom fitted with a chalkboard or whiteboard, an overhead projector or computer-assisted projector and screen are given in the individual subject frameworks.

To assist instructors, references are shown against the subjects in the modules to indicate references and publications, additional technical material and teaching aids that the instructor may wish to use when preparing and presenting the course (see Annex 2). The material listed in the subject frameworks has been used to structure the detailed teaching syllabuses:

1. Teaching aids (indicated by A).
2. Equipment needed by participants (indicated by E).
3. References (indicated by R).
4. - GUIDELINES FOR INSTRUCTORS

# INTRODUCTION

VTS Operators are appropriately qualified persons performing one or more tasks contributing to the services of a VTS centre. It is essential that education and training be aimed at minimising incidents due to mistakes or errors of judgement. This model course is designed to meet the requirements for trainee VTS Operators to obtain a course certificate leading to On-the-Job Training.

It is important to keep in mind the close relationship of all subjects in the VTS Operators course. Instructors should continuously monitor the additional personal attributes of participants and, when appropriate, draw their attention to the need to meet the subjects of that module.

In Vessel Traffic Services, new techniques and equipment are developed very quickly. This makes it necessary for instructors to keep up to date in new techniques and in national and international rules and regulations. Instructors should also be encouraged to teach relevant new developments and techniques not mentioned in this syllabus.

# CURRICULUM

The subject modules into which the course is divided reflect the competence headings of the VTS Operator competence chart (see Annex 1). The syllabuses are presented this way to show clearly the relationship of the syllabus with the recommendations of the IALA.

The subjects shown in the detailed syllabus are not listed in order of priority. Instructors should treat them in the order, which they consider to be the most effective for their course participants and circumstances.

Great care should be taken when using the levels of competence in Table 1. They have been phrased in a precise form to indicate exactly what the participant should be capable of doing. This then becomes the means of demonstrating that the intended level of knowledge or skill has been attained.

The recommended hours given in the syllabi are intended to be used as approximate guidelines for planning purposes. The hours should be adjusted as necessary to suit local circumstances in the light of experience with previous courses. If possible the course should be implemented with some flexibility to allow for adjustments during its running. It is normal for different participants to require different lengths of time to cover the same work. For practical reasons some minor adjustments will probably be needed when drawing up the timetable to fit the work to be covered into fixed teaching periods and term times.

The success of the course will depend, to a large extent, upon detailed co-ordination of the individual subjects into a coherent teaching scheme. It is important that an experienced instructor acts as course co-ordinator to plan and supervise the implementation of the course.

Using the time estimates, modified as appropriate, a timetable should be drawn up to suit the normal working day and terms of the training organisation. Teaching schemes should be prepared by the teaching staff outlining the subject areas to be covered week by week. All members of the teaching team should have a copy of the proposed schemes so that they are aware of what is being done in subjects other than their own.

The teaching schemes should be scrutinised carefully to ensure that all of the listed subjects are covered, that repetition is avoided and that essential pre-requisite knowledge at any stage has already been covered. Only those additional requirements set by the Competent Authority should be introduced.

The course co-ordinator should monitor the running of the course. There should be regular discussions with the teaching staff involved concerning the progress of participants and any problems that have become apparent. Modifications of the teaching scheme should be made where necessary to ensure that participants are attaining the objectives laid down. If necessary, extra tuition should be arranged to enable weaker participants to reach the required standard. At the conclusion of the course a discussion should be held to determine whether changes should be made to improve future courses.

Procedures should be in place to follow the On-the-Job Training (OJT) of participants, using comments from both participants and OJT Instructors to help ensure relevancy and validity of future courses. The transition from advanced training to OJT should appear as continuous as possible.

The course Assessor should be involved actively in course planning and its conduct. Participants who encounter difficulties with any elements of the syllabus should be identified by regular discussions with instructors and analysis of examination results. Additional time should be allocated for tutorials so that every participant who is willing to gain the required competence has every opportunity to do so.

In order to ensure quality management, improvement to the standard of lectures should be obtained through satisfaction feedback from participants based on ISO 9001 principles. Examination results should also be analysed by the course Assessor to determine whether the questions test competency to the required standard. If all participants achieve high scores, the questions may not be sufficiently testing. If all participants fall short of the required standard, the quality of the instruction and content is likely to be below standard too!

# LESSON PLANS

The modular presentation enables the instructor to adjust the course content and provide any revisions of the subject objectives as required. The instructor should draw up lesson plans based on each detailed syllabus and the references in them to the textbooks and teaching material suggested for the course. Where no adjustment has been found necessary in the learning objectives of a detailed syllabus, the lesson plans may simply consist of the detailed syllabus with keywords or other reminders added to assist the instructor in making his presentation of the material.

To assist in the development of lesson plans five levels of competence are used in the model courses for VTS personnel. Levels 1 to 4 are used in the model course for the training of VTS Operators and levels 3 to 5 are used in the model course for advancement to VTS Supervisor.

Each level of competence is defined in terms of the learning outcome, the instructional objectives and the required skills. The recommended level of competence for each subject is indicated in section 3, Subject Outline, of each module.

Section 3, Subject Outline, of each module also includes a recommended assessment of the time that should be allotted to each subject. However, it should be appreciated that these allocations are arbitrary and assume that the trainees have met fully all of the entry requirements specified for each subject. The instructor should therefore review carefully these assessments during course and lesson plan design and consider the need to reallocate the time required to achieve each specific learning objective.

Section 4, Detailed Teaching Syllabus, of each module has been written in learning-objective format in which the objective describes what the trainee must do to demonstrate that knowledge has been transferred. All objectives are understood to be prefixed by the words:

*the expected learning outcome is that the trainee has acquired the recommended levels of competence in …….*

In preparing a teaching scheme and lesson plans, the instructor is free to use any teaching method or combination of methods that will ensure trainees can meet the stated objectives. However, it is essential that trainees attain all objectives set out in each syllabus.

1. Levels of Competence

|  |  |  |
| --- | --- | --- |
| Level | Knowledge and/or Attitude | Skill |
| **Level 1**  Work of a routine and predictable nature generally requiring supervision | **Comprehension**  Understands facts and principles; interprets verbal/written material; interprets charts, graphs and illustrations; estimates future consequences implied in data; justifies methods and procedures | **Guided response**  The early stages in learning a complex skill and includes imitation by repeating a demonstrated action using a multi-response approach (trial and error method) to identify an appropriate response |
| **Level 2**  More demanding range of work involving greater individual responsibility. Some complex/non-routine activities | **Application**  Applies concepts and principles to new situations; applies laws and theories to practical situations; demonstrates correct usage of methods or procedures | **Autonomous response**  The learned responses have become habitual and the movement is performed with confidence and proficiency |
| **Level 3**  Skilled work involving a broad range of work activities. Mostly complex and non-routine | **Analysis**  Recognises un-stated assumptions; recognises logical inconsistencies in reasoning; distinguishes between facts and inferences; evaluates the relevancy of data; analyses the organisational structure of work | **Complex observable response**  The skilful performance of acts that involve complex movement patterns. Proficiency is demonstrated by quick, smooth, accurate performance. The accomplishment of acts at this level includes a highly co-ordinated automatic performance |
| **Level 4**  Work that is often complex, technical and professional with a substantial degree of personal responsibility and autonomy | **Synthesis**  Integrates learning from different areas into a plan for solving a problem; formulates a new scheme for classifying objects or events | **Adaptation**  Skills are so well developed that individuals can adapt rapidly to special requirements or problem situations |
| **Level 5**  Complex techniques across wide and often unpredicted variety of contexts. Professional/senior managerial work | **Evaluation**  Judges the adequacy with which conclusions are supported by data; judges the value of a work by use of internal criteria; judges the value of a work by use of external standards of excellence | **Creation**  The creation of new practices or procedures to fit a particular situation or specific problem and emphasizes creativity based upon highly developed skills |

# EVALUATION OR ASSESSMENT

Continual assessment of participants should be undertaken. In many cases the assessment can be based on the marks given to participants’ course work, providing a proper record of it is kept. That can be supplemented by occasional short test papers. These assessments are additional to any examination required for the purposes of certification.

Assessments should use the following five levels to indicate the progressive learning attained by participants. It is recommended that, for the VTS Operator, an average level of one to four should be considered as being satisfactory.

1. Assessment Levels

|  |  |
| --- | --- |
| LEVEL | DESCRIPTION |
| LEVEL 1 | The participant demonstrates a willingness to learn. |
| LEVEL 2 | The participant demonstrates active participation in the learning process. |
| LEVEL 3 | The training positively influences the participant’s behaviour and attitude, and there is a measurable increase in knowledge and skills. |
| LEVEL 4 | The participant demonstrates the ability to adapt existing knowledge, skills and attitude when dealing with new and unplanned situations. |
| LEVEL 5 | The participant demonstrates a permanent positive change in knowledge, skills and attitude and is ready to positively influence others.  The participant may exhibit some positive changes in co-related behaviours. |

The form and timing of examinations for endorsement as a VTS Operator is a matter for the Competent Authority concerned.

An adequate period should be allowed at the end of the course for revision and review of the course content. That period and the time occupied by any examinations would be additional to the times shown in the syllabuses.

The Competent Authority may recognize documented evidence including assessments completed for the attainment of related certificates as equivalencies for parts or all specific VTS modules.

# PRACTICAL TRAINING

In addition to subject modules; the following are recommended simulated exercises included assessment criteria and recommended duration in hours.

1. Simulation Exercises

| Subject | Assessment criteria | Hours |
| --- | --- | --- |
| **Basic skills**  Monitoring and identification  Communication co-ordination  Evaluation and interpretation of the traffic situation  Log keeping, recording and reporting | Ability to identify, correctly interpret and handle reports from five simulated vessels. | 20 |
| **Traffic interaction and conflict resolution**  Waterway management in multi-ship scenarios  Anticipation and projection of traffic patterns  Critical areas  Vessels overtaking and approaching each other  VTS sailing/route plans, including those for deep draught vessels | Ability to identify, correctly interpret and deal with up to five simulated vessels in complex situations.  Ability to prepare VTS sailing or route plans, to monitor their execution and amend them due to unforeseen circumstances. | 60 |
| **Emergencies and special situations**  Contingency plans  Adverse weather conditions  Special vessels and those with restricted manoeuvrability  Internal and external emergencies | Ability to identify, correctly interpret data and handle reports from 20 simulated vessels during emergencies and special situations. | 20 |

2. - COURSE MODULES

The complete course comprises eight modules, each of which deals with a specific subject representing a requirement or function of a VTS Operator, followed by simulated exercises and assessment intended to be representative of events and incidents likely to be experienced in a VTS centre. The recommended duration in hours do not include the time necessary for examinations or tests of proficiency.

2. Recommend Course Hours

| Module / Subject | Recommended Duration in Hours | | Remarks2 | |
| --- | --- | --- | --- | --- |
| Presentations / Lectures | Exercises / Simulation1 |  |  | |
| 1 – Language3 | 91 | 75 | Language structure  Specific VTS messages construction | Standard phrases  Collecting information | |
| 2 – Traffic Management | 52 | 54 | Regulatory requirements  Roles and responsibilities  VTS environment | Principles of waterway and traffic management  Traffic monitoring and organisation | |
| 3 – Equipment | 39 | 6 | Telecommunications  Radar, audio, video and other sensors  VHF/Direction finding (VHF/DF)  Tracking systems | Information management  Equipment performance monitoring  Evolving technologies | |
| 4 – Nautical Knowledge | 85 | 38 | Chart work  Collision regulations  Aids to navigation | Navigational aids (ship borne)  Shipboard knowledge  Port operations and other allied services | |
| 5 – Communication  Co-ordination | 7 | 11 | General communication skills  Communications | Log and record keeping | |
| 6 – VHF Radio | 15 | 42 | Radio operator practices and procedures  VHF radio systems and their use in VTS | Operation of radio equipment  Communication procedures, including SAR | |
| 7 – Personal Attributes | 6 | 4 | Interaction with others  Human relation skills | Responsibility and reliability | |
| 8 – Emergency Situations | 12 | 10 | International, national, regional, local regulations  Contingency plans  Prioritise and respond to situations | Record activities concerning emergencies  Maintain a safe waterway throughout emergency situations  Internal/external emergencies | |
| **Total** | **307** | **240** |

*Notes: 1 In addition to the above mentioned recommended duration in hours, see table 3 Simulation exercises in Part D, section 5 Practical training.*

*2. The recommended times are, except for Module 1, based on the assumption that trainees have no or little previous knowledge of the subject. The actual time required for each module will vary, depending on previous experience and the entrance level of the trainee.*

*3. The recommended hours for Module 1 assume that trainees have achieved, IELTS level 5, or the equivalent.*

1. LANGUAGE

# INTRODUCTION

Instructors for this module should be skilled in the use of English and the IMO Standard Marine Communication Phrases (SMCP).

## Background

English is the accepted language of international business, trade and diplomacy. Subsequently there is a very high demand for education in the language as well as a high demand for other academic qualifications taught in English. This has led to the establishment of reliable tests to demonstrate that trainees have attained a sufficient level of the language to follow their chosen course or profession (see Annex 3, Example of English language tests).

# SUBJECT FRAMEWORK

## Scope

This syllabus covers the requirement for VTS Operators to have a sufficient knowledge of the English language to be able to use VTS equipment, charts and other nautical publications, understand meteorological and oceanographic information and communicate with ships and allied services for VTS purposes, including the operation of contingency plans.

## Aims of Module 1

On completion of the course trainees will have knowledge of the English language and its composition and structure in respect of maritime terminology and the IMO Standard Marine Communication Phrases to enable them to carry out the duties of a VTS Operator using the English language.

It is emphasized that, by the regular employment of standardized marine vocabulary, VTS Operators will clearly communicate in routine and emergency situations at their VTS centre.

# DETAILED TEACHING SYLLABUS FOR MODULE 1 – LANGUAGE

## Learning objectives

Have a sufficient knowledge of the English language to be able to use charts and other nautical publications, understand meteorological and oceanographic information and communicate with vessels and allied services for VTS mission purposes.

1. Detailed Teaching Syllabus - Module 1

| Module | Element | Sub-element | Subject | Level of Competence | Recommended training aids; exercises and external visits | References  Rec = Recommendation  GL = Guideline | Lecture No. |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **1** |  |  | **LANGUAGE** |  | | | |
|  | **1.1** | **Language structure** |
|  |  | 1.1.1 | Message construction in English | 3 | A1 or A8 | R[6], R[19],R[32] |  |
|  |  | 1.1.2. | English for special purposes, redundancy and precision | 3 |  |  |  |
|  |  | 1.1.3 | Elimination of ambiguity by choice of words | 3 | A1 or A8 | R[19](VTS section) |  |
|  |  | 1.1.4 | Elimination of ambiguity by special techniques | 3 |  |  |  |
|  |  | 1.1.5 | Status of a message | 3 | A1 | R[19](VTS section), R[13] |  |
|  | **1.2** |  | **Specific VTS message construction** |  | | | |
|  |  | 1.2.1 | Construction of messages | 4 | A1 | R[19] |  |
|  |  | 1.2.2 | Speech devices to imply higher message status | 4 |  |  |  |
|  | **1.3** |  | **Standard phrases** |  | | | |
|  |  | 1.3.1 | The advantages, disadvantages and application of standard phrases | 2 | A1 | R[19] |  |
|  |  | 1.3.2 | The IMO SMCP in general | 2 |  |  |  |
|  |  | 1.3.3 | The IMO SMCP, part 3, section 6, VTS | 3 |  |  |  |
|  | **1.5** |  | **Collecting information** |  | | | |
|  |  | 1.4.1 | Questioning techniques s | 2 | A1 | R[19] |  |

## Recommended hours

Presentations / Lectures 91

Exercises / Simulation 75

Notes:

1. The time required for module 1 above will vary with the entrance level of the trainee.
2. The recommended hours are set on the assumption that the trainee has achieved IELTS level 5 or the equivalent.
3. TRAINING NEEDS ANALYSIS – EXAMPLE FORMAT
4. Introduction

The process of specific training is conducted in six steps:

1. Determine what needs to be taught – in this case the syllabus set out in Part E of this document.
2. Analysis of existing competencies held by potential participants.
3. Determine which participants are exempt from specified subjects and which require full or additional training.
4. Plan lectures based on who needs to be taught what.
5. Lecture delivery and documentation.
6. Analyse training feedback and update lecture plans.
7. The Syllabus

The syllabus is broken down into Modules, elements and sub-elements. The IALA Model course for AtoN Level 1 Managers has been formatted in this manner.

1. Analysis of Existing Competencies

Before the start of the course of instruction, each participant, regardless of previous qualifications or experience, will be asked to take a short competency test followed by a private interview to determine his or her training needs. It should be explained that the sole aim is for the participant to determine for themselves the amount of instruction that will be required so that they can demonstrate competency in each Module by passing each Module test. It should be explained that all participants will be required to sit the Module tests, even though they hold a professional qualification in a particular subject area.

Each participant will be given a 100 question test paper based on the complete syllabus for the IALA Model Course. Each question requires a one-word or short phrase answer and will be timed for completion in 60 minutes. Participants will be expected to answer the questions from memory without referring to text books or other documentation. After the test has been completed, each participant will be given an answer sheet so that participants can self-mark their papers. Participants will then be interviewed privately by the course Assessor. Each Module should be analysed by sub-elements. Existing proven competencies for which the participant required no further training will be given a green flag. Red flags will be allocated to sub-elements where further training is either requested or required. A matrix of which participant requires what training in various subjects can then be produced which shows which participant should attend which lecture or whether exemption in a complete Module or subject element can be granted. See Table 6 below.

1. Example of Participant Training Needs

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Module | Element | Sub-element | Subject | Participant A | Remarks | Participant B | Remarks | Participant C | Remarks |
| 1 |  |  |  |  |  |  |  |  |  |
| 2A |  |  | NAUTICAL KNOWLEDGE (GENERAL) |  | Master Mariner |  | No maritime experience |  | Limited maritime experience |
|  | 2a.1 | Introduction – Principles of Navigation |  |  |  |
|  |  | 2a.1.1 | Introduction to methods of navigation; Lines of Position |  |  |  |
|  |  | 2a.1.2 | Accuracy standards |  |  |  |
| 3-4 |  | etc. |  |  |  |  |  |  |  |
| 5 |  |  | POWER SUPPLY |  | Unfamiliar with power supply options for AtoN |  | Degree in electrical engineering |  | No formal qualification held |
|  | 5.1 |  | Types of Power Supply |  |  |  |
|  |  | 5.1.1 | Non-electrical energy sources |  |  |  |
|  |  | 5.1.2 | Electric energy sources |  |  |  |

1. Lecture Planning

Having determined who needs to be taught what, the course Assessor allocates specific lectures to individual instructors, engaging external lecturers where required. Instructors then use the required level of competence, recommended training aids and references shown in the Model Course to prepare a series of 40 minute lectures in Microsoft PowerPoint® format supported by hand-outs containing all appropriate references. Each lecture ends with a list of key learning points. An allocation of 10 minutes should be made for questions.

1. Preparation of Test Papers

Instructors responsible for each Module should prepare written test papers on what was taught with questions set at the appropriate level of difficulty based on the required level of competence.

1. Documentation

A record, based on Quality Management System principles should be maintained of training progress and results.

1. Training Feedback and Analysis

Feedback from participants and an analysis of test papers should be used to improve the quality of lectures.

1. EXAMPLE OF AN APPENDIX TITLE
2. APPENDIX HEADING 1

Body text

* 1. APPENDIX HEADING 2

Body text

* + 1. APPENDIX HEADING 3

Body text

* + - 1. Appendix Heading 4

Body text

1. EXAMPLE ANNEX TITLE

Introduction (Example Annex Heading 1)

Body text.

* 1. Example of ANNEX HEADING Level 2

Body text

* + 1. Example of annex heading level 3

Body text

* + - 1. Example of annex heading level 4

Body text

1. EXAMPLE ANNEX TITLE

1. Definitions and clarifications of terms and common abbreviations used in the text of this document are listed at Articles 1.2 and 1.4 of IALA Recommendation E-141. [↑](#footnote-ref-1)